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PATENT APPLICATION

BY

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FOR LETTERS PATENTS FOR

SEAT BELT INHIBITOR

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SEAT BELT INHIBITOR

Background

The present invention relates to an inhibitor for seat belt release mechanisms. In particular, the present invention relates to an easy to install and uninstall inhibitor for seat belt latch actuators that prevents a user, such as a small child, from accidentally unfastening the seat belt.

Seat belts in automobiles save thousands of lives each year while, thousands of auto accident fatalities would have been avoided if the victim had been wearing a seat belt. Accordingly, buckling up the seat belt dramatically increases the occupant's chance of surviving an auto accident. Since the seat belt is crucial for an occupant, it is essential that the seat belt remains properly engaged during use.

Sometimes, after a child has been safely strapped into an automobile seat, the child, while looking for interesting objects to play with as the automobile is moving may accidentally depress the seat belt actuator. This would release the seat belt, and create an extremely dangerous situation for the child. The driver will also be placed in a dangerous position as he or she attempts to re-fasten the seat belt clasp in the rear seat while attempting to drive the car at the same time.

FIG. 1 illustrates in perspective view a typical seat belt 10 installed in automobiles. The seat belt 10 includes a lock 12 fixed to a belt portion 14 and a connector 16 fixed to another belt portion 15 of the seat belt 10. Typically, the generally rectangular lock 12 is attached to the belt portion 14 at one end and has a slot 18 at the other end for receiving the connector 16. The

generally flat connector 16 includes a wider portion 17 at its proximal end which is attached to the belt portion 15, and a narrower portion 19 at its distal end to be received in the slot 18. This configuration forms shoulders 20 between the distal and proximal portions of the connector 16. The connector 16 further includes an opening 22 in the distal portion.

A mechanism within the lock 12 co-acts with the opening 22 of the connector 16 to engage the connector 16 with the lock 12 when connector 16 is inserted into recess 18. A release or latch actuator, 24, such as a manually operated button, is typically positioned on a front side of the lock 12 facing the connector 16, wherein the release 24 selectively engages and disengages the connector 16 to the lock 12. The release 24 is typically positioned within a recessed opening 26 and is dimensioned to readily admit the finger of an adult user to depress and activate the release 24. Upon activating the release 24, the connector 16 disengages with the lock 12, opening the seat belt 10.

FIG. 2 illustrates in perspective view another typical seat belt 11. In this configuration, the lock 12 and connector 16 are generally flat and square shaped. The connector 16 is wide enough to insert into the slot 18 in the front surface of lock 12. The release 24 is typically exposed to an upper side 23 of the lock 12 to allow access by an adult user.

FIG. 3 illustrates in sectional view the lock 12 of FIG. 2 with the connector 16 inserted therein. In FIG. 3, the release 24, defined by a button, may be a U-shaped member having a leg 25 which is urged against the lock wall 29 closing the opening 26. Another leg 31 of this U-shaped member is provided with pivots 28 seated in recesses within the lock 12 and providing a pivot mounting for the release 24. A spring 30 urges the release 24 to the illustrated position which is the normal position. An angular, rigid member 32 projects upwardly from the lower leg

31 of release 24 while supports 34 fixed to the side walls of the lock 12 provide stops to limit upward movement of the connector 16 when inserted into the lock 12.

It will be seen that when the connector 16 is inserted into the slot 18 of the lock 12, it is guided between the lower leg 31 of release 24 and the supports 34. When the distal end of the connector 16 engages the member 32, the release 24 is cammed downwardly as viewed in FIG. 3, allowing the distal end of the connector 16 to pass over the member 32. The spring 30 will then urge the member 32 upwardly to move the member 32 into the connector opening 22 in the illustrated latched position.

It will be seen further that by depressing the release 24 through opening 26, the entire member 32 will be pivoted downward about the pivots 28, releasing the member 32 from the connector 16 to allow unfastening of the seat belt. As seen in FIGS. 1, 2 and 3, the release 24 is within the recessed opening 26 of the lock 12 to provide limited protection of accidental release.

Properly maintaining a child within the seat belt of a moving vehicle is crucial for the child's safety. As illustrated, a problem with typical seat belts is the exposed accessibility of the release mechanism. A toddler or even an infant can access the release to unbuckle the seat belt which voids the preventative protection of the seat belt. Although an infant may be secured in a car seat, a sibling also may easily activate the release.

Accordingly, a need exists for a device to inhibit access to the accidental or unintentional release of a seat belt. As such, the solution must conveniently remove the inhibiting device from the seat belt by one motion to provide the adult a quick and convenient release to comfortably remove the child. Accordingly, the solution must not completely enclose the seat belt operating mechanism since enclosing the seat belt requires multiple actions by the adult to

access the seat belt. The solution, however, must provide limited but direct access, by an adult, to the release in order to unbuckle the seat belt.

Brief Description of the Drawings

Fig. 1 illustrates in perspective view a typical seat belt buckle and latch;

Fig. 2 illustrates in perspective view another typical seat belt buckle and latch;

Fig. 3 illustrates in cross sectional view the buckle and latch portions of the seat belt, buckle and latch of Fig. 2;

Fig. 4 illustrates in isometric view an embodiment of the inhibitor device of the present invention;

Fig. 5 illustrates in bottom view the inhibitor device of Fig. 4;

Fig. 6 illustrates in bottom view the engaged seat belt mechanism, including the inhibitor;

Fig. 7 illustrates in isometric view the inhibitor device of Fig. 4 engaging with a seat belt buckle of the type shown in Fig. 1;

Fig. 7a illustrates in isometric view the inhibitor device of Fig. 6 engaged with the seat belt buckle of Fig. 1;

Fig. 8 illustrates in isometric view an embodiment of the inhibitor device, which embodiment is adapted to be used with the seat belt, buckle and latch shown in Figs. 2 and 3;

Fig. 9 illustrates in bottom view the inhibitor of Fig. 8;

Fig. 10 illustrates in bottom view the inhibitor and buckle of Fig. 9; and

Fig. 11 illustrates in isometric view the inhibitor device of Fig. 8 engaging with a seat belt buckle of the type shown in Fig. 2.

Summary of the Invention

The present invention relates to a seat belt actuation inhibitor. In particular, the present invention relates to an inhibitor that limits access to the release of a seat belt by a child. The inhibitor is used with a seat belt buckle and latch combinations that include a lock, connector and release. The inhibitor comprises a cover having a pair of opposing sidewalls extending perpendicular from the cover, and a top extending perpendicular from the cover to partially overlap the opposing sidewalls. A pair of flanges extends perpendicular from the sidewalls toward each other in a spaced relation wherein the cover, sidewalls, top and flanges are sized and shaped to be removably engaged with the lock housing.

The present invention also relates to a method of inhibiting release of a seatbelt which includes a lock , a connector and a release comprising positioning an inhibitor near the lock and inserting portions of the lock between the flanges of the inhibitor that are spaced apart from contacting each other. Next, the user rotates the flanges to overlap the portions of the lock to engage the lock. The inhibitor is designed to permit the seat belt latch to be engaged with the lock while the inhibitor is mounted on the buckle or lock housing.

Detailed Description

As stated, the present invention relates to a seat belt actuation inhibitor. In particular, the present invention relates to an inhibitor that limits access to the release of a seat belt by a child. Fig. 4 illustrates in isometric view an exemplary embodiment of the inhibitor, generally shown as 40, wherein the inhibitor 40, comprises a cover 42, sidewalls 44, a top 46, flanges 48 and a tab 50.

As shown in Fig. 4, sidewalls 44 of inhibitor 40 extend perpendicular from the cover 42 wherein the sidewalls 44 may slightly curve, where they meet cover 42. The top 46 also extends

outwardly from the cover 42 in the same direction as the sidewalls 44. Accordingly, the top 46 extends perpendicularly from the cover 42. As such, the edges 47, 49 of the top 46 partially overlap the sidewalls 44. Although the top 46 extends in the same direction as the sidewalls, the top 46 may be located at a lateral distance from the sidewalls 44. The flanges 48, meanwhile, extend perpendicular from the sidewalls 44 toward each other. Since the sidewalls 44 and the top 46 are substantially the same length, the top 46 also overlaps the flanges 44 in a plane different from that of the sidewalls 44. The flanges 48 may be positioned at a distance from the top 46 substantially equal to the height of the sidewalls 44. As illustrated, the top 46, sidewalls 44, cover 42 and flanges 48 are preferably integrally formed from a pliable material such as plastic.

The inhibitor 40 further comprises an aperture 52 positioned through the top 46, wherein the aperture 52 may comprise a variety of forms such as a slot. The aperture 52 provides access for an adult user to activate the seat belt release 24 (Fig. 1) as will be discussed. Additionally, the inhibitor 40 positions the tab 50 on the cover 42 wherein the tab 50 is adapted to movably secure the inhibitor 40 to the seat belt portion 14 (shown in Fig. 1) to prevent losing the inhibitor 40 during non use. The tab 50 may be integrally formed with the cover 42 or may be attached to the cover 42. Additionally, the tab 50 may be positioned on the sidewalls 44, the top 46 or flanges 48.

Fig. 5 illustrates in bottom view the inhibitor 40 of Fig. 4. As illustrated, the flanges 48 extend toward each other in a spaced relation 54 while remaining free from contacting each other. In addition to being overlapped by the top 46, the flanges 48 are positioned under the cover 42. As configured, the spaced relation 54 is accessible through the top 46 via the aperture 52.

Fig. 6 illustrates in bottom view the inhibitor 40 engaged to the lock 12 of the typical seat belt 10 of Fig. 1. As illustrated, the flanges 48 clamp to the bottom portions of the lock 12 while exposing portions of the lock 12 between the spaced relation 54 of the flanges 48. Since the release 24 is positioned on the front of the lock 12, the release 24 abuts adjacent to the aperture 52 positioned through the top 46.

To engage the lock 12 within the inhibitor 40 when the lock 12 is disengaged from the connector 16 (Fig. 1), the user slides the inhibitor 40 over the lock 12 by sliding the cover 42 along the belt portion 14 (Fig. 1) via the tab 50. The tab 50 conveniently keeps the inhibitor 40 near the belt portion 14 in the disengaged state to prevent separating the inhibitor 40 from the seat belt portion 14. The user then slides the lock 12 into the exposed space formed by the cover 42, the sidewalls 44, the top 46 and flanges 48. For the engagement, the front side of the lock 12 having the release 24 is slid first within the cover 42 to position the release 24 next to the aperture 52 of the top 46 as shown in Fig. 6. Since the lock 12 is not completely surrounded by the inhibitor 40, but instead slides within and along the flanges 48, the user may easily slide the lock 12 with one hand within the flanges 48.

Instead of sliding the lock 12 into the inhibitor 40, the user may clamp the inhibitor 40 to the lock 12. In this method, the user turns the cover 42 to position the flanges 48 toward the lock 12. Since the flanges 48 are separated by the spaced relation 54, the user simply inserts a portion such as the side of the lock 12 between the flanges 48. Next, the user twists the flanges 48 to pressure or to snap the flanges 48 against portions of the bottom of the lock 12. This twist movement also positions the cover 42 against the upper portion of the lock 12 while positioning the top 46 of the inhibitor 40 over the release 24. Additionally, the release 24 is positioned behind the aperture 52. Thus, the twist or snap movement of the flanges 48 clamps the inhibitor

40 to the lock 12 with one quick and convenient motion. Accordingly, the user may engage and disengage the lock 12 to the flanges 48 by twisting or snapping the flanges 48 by using one hand.

Turning to Fig. 7, the inhibitor 40 of Figs. 4 and 5 is shown engaging the latch connector 16 of seat belt 10 of Fig. 1. The cover 42, top 46, sidewalls 44 and flanges 48 are sized and shaped to be removably engaged to the lock 12 of the seat belt 10 such that the lock 12 fits into the inhibitor 40 since the inhibitor 40 easily flexes and clamps to engage the lock 12. Since the sidewalls 44 and top 46 extend perpendicular from the cover 42, and the flanges 48 extend perpendicular to the sidewalls 44, the inhibitor 40 forms a space or pocket to engage the lock 12 as discussed.

In this configuration, the top 46 extends to overlap the release button 24 to prevent access to the release 24. The aperture 52, positioned through the top 46, provides limited access to the release 24 such that an adult may manipulate a slender item, such as a key, screw driver or the like, through the aperture 52 to access and to activate the release 24 as will be discussed. The top 46, however, prevents a user from directly contacting the release 24 to prevent inadvertent or accidental disengagement of the release 24. The top 46 also prevents the inhibitor 40 from sliding down and off the lock 12 when the lock 12 is positioned within the inhibitor 40 and separated from the connector 16, since the top 46 extends perpendicular from the cover 42 to maintain the engagement of the lock 12 and inhibitor 40.

Turning to Fig. 7a, the inhibitor 40 of Figs. 4 and 5 is shown connected with the lock 12, which is engaged with connector 16 of seat belt 10 of Fig. 1. As configured, the top 46 does not extend beyond the release 24. As such, the top 46 is positioned over the release 24 while remaining free from contact with the connector 16. In other words, the connector 16 does not contact the top 46 while engaging the lock 12. The top 46, though, still prevents access to the

release 24. Since the top 46 is positioned free from contacting the connector 16, the connector 16 may engage with the lock 12 without interacting with, or removal of, the inhibitor 40. Accordingly, the positioning of the top 46 allows hindrance free interaction between the lock 12 and connector 16 during engagement and disengagement.

After engaging the lock 12 and connector 16, the user disengages the inhibitor 40 from the lock 12 by unclamping or twisting the flanges 48 to release the lock 12. The user holds the sidewalls 44 and twists the flanges 48 to release or snap out the lock 12. The tab 50, meanwhile, holds the unclamped inhibitor 40 to prevent the inhibitor 40 from falling away from the belt portion 14. Accordingly, the flanges 48 allow for one motion to free the lock 12. Also, since the top 46 does not contact or surround the connector 16, the inhibitor 40 separates from the lock 12 without interference from the connector 16 to quicken the release from the lock 12 by the user. The user then disengages the connector 16 from the lock 12 by pressing the now exposed release 24 to free the occupant.

Instead of unclamping the flanges 48 to expose the release 24, the user may also insert an object, such as a key, into the aperture 52 to access the release 24. In this method, the user then presses the object through the aperture 52 to depress the release 24. Accordingly, the aperture 52 may be sized as a slot to allow for the object to contact the release 24. After activating the release 24, the user disconnects the connector 16 from the lock 12. Once the connector 16 is free, the user may slide the inhibitor 40 off the lock 12.

Fig. 8 illustrates in an isometric view another exemplary embodiment of the inhibitor generally shown as 40, wherein the inhibitor 56 comprises a cover 58, sidewalls 60, a top 62, flanges 64 and a tab 66. Similar to the previous embodiment, the sidewalls 60 extend perpendicular from the cover 58 wherein the sidewalls 60 may slightly curve while extending

from the cover 58. The top 62 also extends outwardly from the cover 58 in the same direction as the sidewalls 60. As such, the edges 68, 70 and the top 62 partially overlap the sidewalls 60. The flanges 64, meanwhile, extend perpendicular from the sidewalls 60 toward each other. As illustrated, the top 62, sidewalls 60, cover 58 and flanges 64 are integrally formed from a pliable material such as plastic.

The inhibitor 56 further comprises an aperture 80 which is positioned through the cover 58, wherein the aperture 80 may comprise a variety of forms such as an oval. The aperture 80 provides access for an adult user to activate the release 24 (Figs. 2 and 3) as will be discussed. Thus, the aperture 80 is positioned through the cover 58 as opposed to the aperture 80 being positioned through the top 62 as illustrated in Fig. 4. Additionally, the inhibitor 56 positions the tab 66 on the cover 58 wherein the tab 66 is adapted to movably secure the inhibitor 56 to the seat belt portion 14 (shown in Fig. 2) to prevent losing the inhibitor 56 during non use. The tab 66 may be integrally formed with the cover 58 or may be attached to the cover 58. Additionally, the tab 66 may be positioned on the sidewalls 60, the top 62 or flanges 64.

Fig. 9 illustrates in bottom view the inhibitor 56 of Fig. 8. As illustrated, the flanges 64 extend toward each other in a spaced relation 82 while remaining free from contacting each other. In addition to being overlapped by the top 62, the flanges 64 are positioned under the cover 58. As configured, the spaced relation 82 is accessible through the cover 58 via the aperture 80.

Fig. 10 illustrates in bottom view the inhibitor 56 engaged to the lock 12 of the seat belt 11 of Fig. 2. As illustrated, the flanges 64 clamp to the bottom portions of the lock 12 while exposing portions of the lock 12 between the spaced relation 82 of the flanges 64. Since the

release 24 is positioned on the upper portion of the lock 12, the release 24 abuts to the aperture 80 positioned through the cover 58.

To engage the lock 12 within the inhibiter 40 after the lock 12 is disengaged from the connector 16 (Fig. 2), the user slides the cover 58 along the belt portion 14 via the tab 66, wherein the tab 66 conveniently keeps the inhibitor 56 near the belt portion 14 in the disengaged state to prevent separating the inhibitor 56 from the seat belt portion 14. The user then slides the lock 12 into the exposed space formed by the cover 58, the sidewalls 60, the top 62 and flanges 64. For the engagement, the upper portion of the lock 12 having the release 24 is slid under the cover 58 to position the release 24 under the aperture 80 of the cover 58 as shown in Fig. 10. Since the lock 12 is not completely surrounded by the inhibitor 56, but instead slides within and along the flanges 64, the user may easily slide the lock 12 with one hand within the flanges.

Instead of sliding the lock 12 into the inhibitor 56, the user may clamp the inhibitor 56 to the lock 12. In this method, the user turns the cover 58 to position the flanges 64 toward the lock 12. Since the flanges 64 are separated by the spaced relation 82, the user simply inserts a portion of the lock 12 between the flanges 64. Next, the user twists the flanges 64 to pressure or to snap the flanges 64 against portions of the bottom of the lock 12. This twist movement also positions the cover 58 against the upper portion of the lock 12 while positioning the aperture 80 under the cover 58. Additionally, the aperture 80 is positioned over the release 24. Thus, the twist or snap movement of the flanges 64 clamps the inhibitor 56 to the lock 12 with one quick and convenient motion. Accordingly, the user may engage and disengage the lock 12 to the flanges 64 by twisting or snapping the flanges 64.

Turning to Fig. 11, the inhibitor 56 of Figs. 8 and 9 is shown engaging the connector 16 of seat belt lock 11 of Fig. 2, where the release 24 is on the upper portion of the lock 12, rather

than the front side of lock 12. The cover 58, top 62, sidewalls 60 and flanges 64 are sized and shaped to be removably engaged to the lock 12 of the seat belt 11 such that the lock 12 may easily slide within the inhibitor 56 since the inhibitor 56 easily flexes and clamps to ensure the lock 12. Since the sidewalls 60 and top 62 extend perpendicular from the cover 58 and the flanges 64 extend perpendicular to the sidewalls 60, the inhibitor 56 forms the exposed space or pocket to ensure the lock 12 as discussed.

In this configuration, the cover 58 extends to overlap the release button 24 to prevent access to the release 24. The aperture 80, positioned through the cover 58, provides limited access to the release 24 such that an adult may manipulate a slender item, such as a key, screw driver or the like, through the aperture 80 to access and to activate the release 24 as will be discussed. The cover 58, however, prevents a user from directly contacting the release 24 to prevent inadvertent or accidental disengagement of the release 24. As shown, the top 62 prevents the inhibitor 56 from sliding down and off the lock 12 when the lock 12 is positioned within the inhibitor 56 and separated from the connector 16, since the top 62 extends perpendicular from the cover 58 to maintain the engagement of the lock 12 and inhibitor 56.

Turning to Fig. 11, the inhibitor 56 of Figs. 8 and 9 is shown connected with the lock 12 which is engaged with the connector 16 of seat belt 11 of Fig. 2. As configured, the top 62 does not extend beyond the release 24. As such, the top 62 is positioned over the release 24 while remaining free from contact with the connector 16. In other words, the connector 16 does not contact the top 62 while engaging the lock 12. The top 62, though, still prevents access to the release 24. Since the top 62 is positioned free from contacting the connector 16, the connector 16 may engage with the lock 12 without interacting with, or removal of, the inhibitor 56.

Accordingly, the positioning of the top 62 allows hindrance free interaction between the lock 12 and connector 16 during engagement and disengagement.

After engaging the lock 12 and connector 16, the user disengages the inhibitor 56 from the lock 12 by unclamping or twisting the flanges 64 to release the lock 12. The user holds the sidewalls 60 and twists the flanges 64 to release or snap out the lock 12. The tab 66, meanwhile, holds the unclamped inhibitor 56 to prevent the inhibitor 56 from falling away from the belt portion 14. Accordingly, the flanges 64 allow for one motion to free the lock 12. Also, since the top 62 does not contact or surround the connector 16, the inhibitor 56 separates from the lock 12 without interference from the connector 16 to quicken the release from the lock 12 by the user. The user then disengages the connector 16 from the lock 12 by pressing the now exposed release 24 to free the occupant.

Instead of unclamping the flanges 64 to expose the release 24, the user may also insert an object, such as a key, into the aperture 80 to access the release 24. In this method, the user then presses the object through the aperture 80 to depress the release 24. Accordingly, the aperture 80 may be sized as a slot to allow for the object to contact the release 24. After activating the release 24, the user disconnects the connector 16 from the lock 12. Once the connector 16 is free, the user may simply slide the inhibitor 56 off the lock 12.

While the concepts of the present disclosure have been illustrated and described in detail in the drawings and foregoing description, the illustrations and descriptions are to be considered as exemplary and not restrictive in character, it being understood that only the illustrative embodiments have been shown and described and that all changes and modifications that come within the spirit of the disclosure are desired to be protected by the following claims.